Practical Instrument Electronics

Model 522

Thermocouple Calibrator

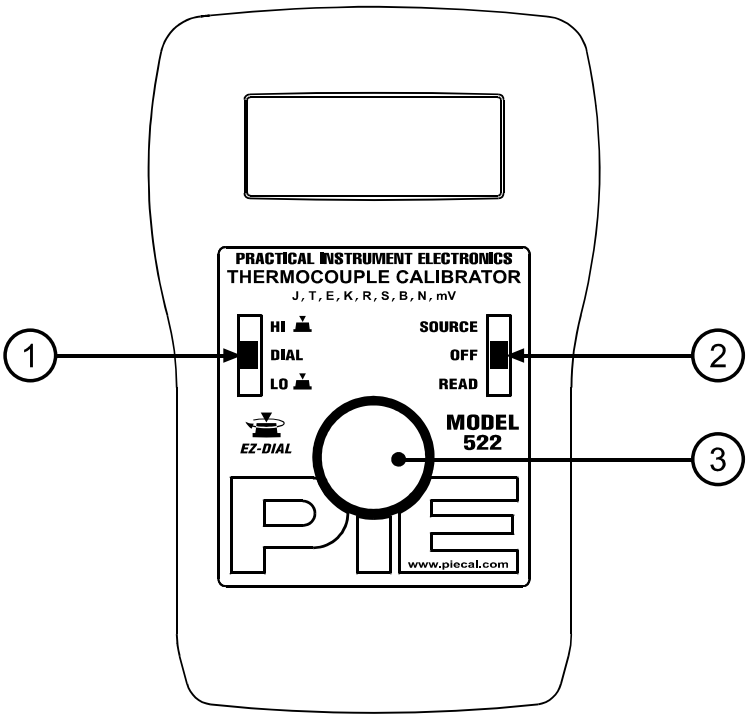
Operating Instructions

Basic Keypad Operations

① EZ-Check™ Switch

SOURCE mode: Slide the switch to select from three user-stored values for the desired calibration points. The user can select HI, DIAL and LO positions. These values can easily be changed to suit the calibration requirements.

READ mode: Slide the switch to recall minimum and maximum readings. Press the **EZ-Dial™ Knob** to clear the stored values.



② SOURCE/OFF/READ Switch

Slide the **SOURCE/OFF/READ Switch** to **SOURCE** to output a voltage corresponding to the temperature on the display for the selected thermocouple type. Use the **READ** position to directly convert thermocouple input to temperature.

③ EZ-Dial™ Knob

Turn the knob to change temperature in 0.1º increments. Push and turn for faster dialing. Push without turning to store new EZ-Check™ HI/LO points in SIMULATE mode, or to clear EZ-Check™ HI/LO points in READ mode.

Model 522 Configuration

Instructions for Enabling and Disabling the Configuration Options

1. Turn the Model 522 on with the SOURCE/OFF/READ Switch.
2. Press the EZ-Dial™ Knob while the "PRESS EZ-DIAL KNOB FOR CONFIGURATION" message is displayed.
3. Select options by turning the EZ-Dial™ Knob until the arrow points to the desired option.
4. The option can be enabled or disabled by tapping the EZ-Dial™ Knob.

The Model 522 configuration menu will exit automatically after 5 seconds of inactivity and go to normal operation with the options selected. These options are saved even when the unit is turned off.

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Model 522 Configuration

Double-click the EZ-Dial™ Knob while in source or READ mode to enter the configuration menu.

Hold the EZ-Dial™ Knob while turning the unit on to bypass the "PRESS EZ-DIAL KNOB FOR CONFIGURATION" message altogether.

Model 522 Configuration Menu

Auto Off **ON/OFF**

If Auto Off is ON, the unit will turn off after 30 minutes to save battery life, if there is no user activity. If Auto Off is OFF the unit will stay on until it is turned off from the keypad. This is typically useful for manual loading or continuous use.

Display Units **°C/°F**

Pressing the EZ-Dial™ Knob to toggles between °C or °F

T/C **B, E, J, K, N, R, S, T, or mV**

To change T/C type, press the **EZ-Dial™ Knob**. Turn the **EZ-Dial™ Knob** to scroll through the list of available types. Press again to save and return to the configuration menu.

READ Mode

Slide the **SOURCE/OFF/READ Switch** to **READ** for direct thermocouple input. The Model 522 displays temperature corresponding to input for the selected thermocouple type.

Connect the T/C sensor. "OPEN T/C" will be displayed until properly connected.

Slide the EZ-Check™ Switch to HI and LO to recall maximum and minimum saved readings. Press and hold the EZ-Dial™ Knob to clear saved readings. The display flashes "CLEARED" as a confirmation.

Double-click the EZ-Dial™ Knob to return to the configuration menu.

Turning the EZ-Dial™ Knob has no effect in READ mode.

Other Display Indications:

OVERRANGE or **UNDERRANGE**	The millivoltage input exceeds the selected thermocouple type's range.
OPEN T/C	No thermocouple is connected, or the connected thermocouple exhibits > 10 kΩ.

SOURCE Mode

Slide the **SOURCE/OFF/READ Switch** to **SOURCE** for direct thermocouple output. The Model 522 outputs voltage corresponding to temperature for the selected thermocouple type.

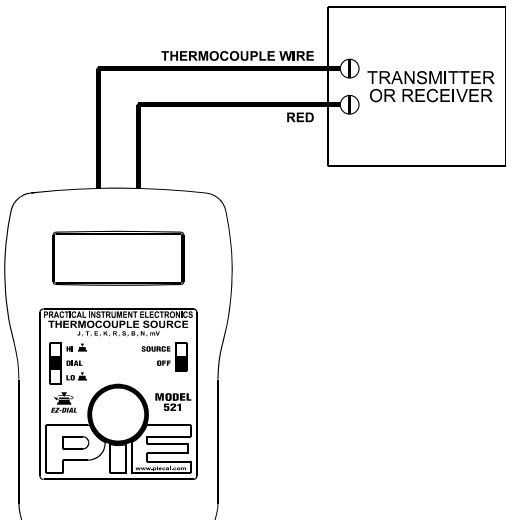
Slide the EZ-Check Switch to HI or LO to recall stored settings. While in the HI or LO position, dial a new setting and press the EZ-Dial™ Knob to store. The DIAL position always holds the last setting dialed there.

Turn the EZ-Dial™ Knob to change temperature, push and turn for faster dialing.

Double-click the EZ-Dial™ Knob to return to the configuration menu.

Connection Diagram

Two Wire Connection to Transmitter



Specifications

General Specifications:

Unless otherwise indicated all specifications are rated from a nominal 23 °C, 70 % RH for 1 year from calibration.

Temperature Range	-25 to 60 °C (-10 to 140 °F)
Relative Humidity Range	10 % ≤RH ≤90 % (0 to 35 °C), Non-condensing
	10 % ≤RH≤ 70 % (35 to 60 °C), Non-condensing
Overall Size	4.9 X 3.15 X 1.82 inches (125.5 X 80 X 46.2 mm)
Overall Weight (including 9V battery)	7.2 oz (204 grams)
Battery	9V Alkaline provides 45 hours of continuous use
Miscellaneous	Low battery indication with nominal 1 hour of operation left
	Overload protected to 60 volts for 30 seconds or less
	High-contrast graphic liquid crystal display with *0.357" (9.07 mm)* high digits
Accuracy:	
Millivolt Accuracy	±(0.008 % of mV Setting + 0.006 mV)
Temperature Coefficient of mV Source	50 ppm/°C of output range
Cold Junction Calibration Accuracy	±0.1 °C (0.2 °F)
Cold Junction Sensor Temperature Coefficient	±0.025 °/° in ambient temperature (°C or °F)
General Temperature Accuracy	±(0.008 % of mV setting + 0.006 mV) ± 0.1 °C (0.2 °F)
Resolution	0.1 °C or 0.1 °F

SOURCE Thermocouple Specifications:

Output Range	-13.000 to +80.000 mV
Output Noise	±5 µV pp from 0.1 Hz to 10 Hz
Output Impedance	0.2 Ω (200 nV/uA)
Source Current	< 8 mA

READ Thermocouple Specifications:

Input Noise	< ±1 LSD from 0.1 Hz to 10 Hz
Input Impedance	> 1 MΩ
Open T/C Test Pulse	< 1 uA for 300 ms
Open T/C Response Time	< 3 seconds
Open T/C Threshold	10 kΩ nominal

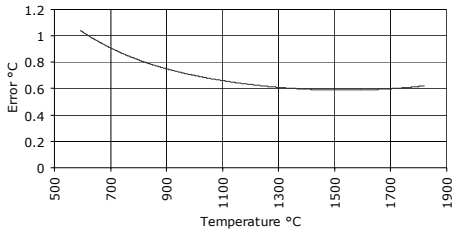
Available Options:

Carrying Case	Part Number: 020-0201

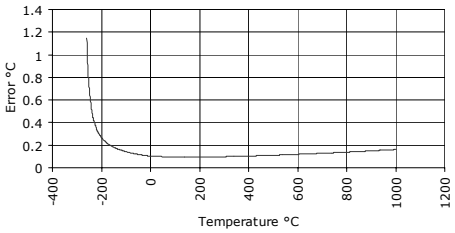
Temperature Accuracy

The following charts give worst-case temperature accuracy based on stated millivolt accuracy of ±(0.008 % + 0.006). Temperature is uncompensated on the horizontal axis, referenced to 0 °C. Cold Junction calibration accuracy of 0.1 °C is not included in the temperature error.

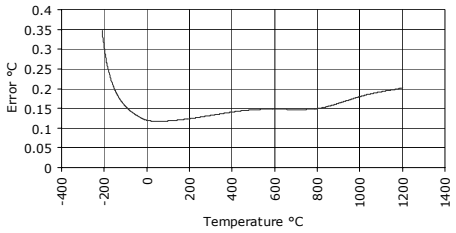
TYPE B
594 to 1820 °C



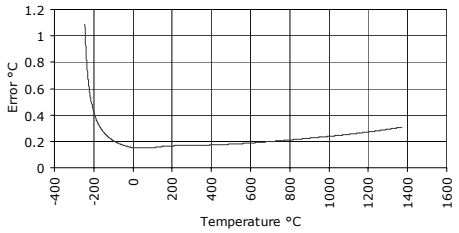
TYPE E
-260 to 1000 °C



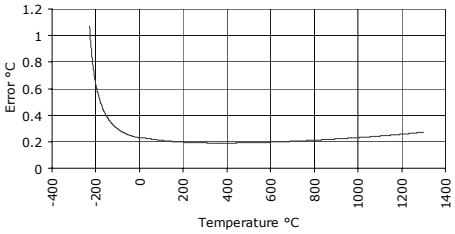
TYPE J
-210 to 1200 °C



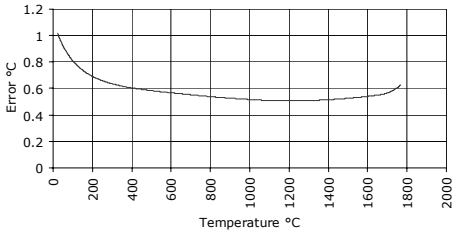
TYPE K
-245 to 1372 °C



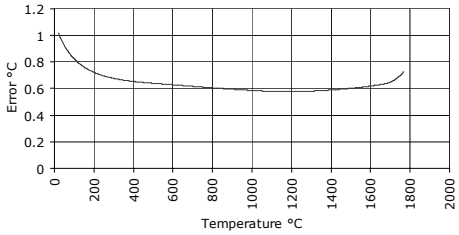
TYPE N
-229 to 1300 °C



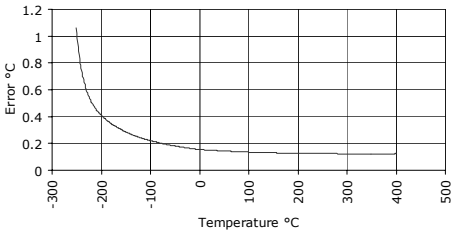
TYPE R
24 to 1768 °C



TYPE S
21 to 1768 °C



TYPE T
-251 to 400 °C



Warranty

Our equipment is guaranteed against defective material and workmanship (excluding batteries) for a period of three years from the date of shipment. Claims under guarantee can be made by returning the equipment prepaid to our factory. The equipment will be repaired, replaced or adjusted at our option. The liability of Practical Instrument Electronics (PIE) is restricted to that given under our guarantee. No responsibility is accepted for damage, loss or other expense incurred through sale or use of our equipment. Under no condition shall Practical Instrument Electronics, Inc. be liable for any special, incidental or consequential damage.